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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,625	05/24/2006	Raymond J. E. Hueting	GB03 0212 US	4378
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NXP, B.V. NXP INTELLECTUAL PROPERTY & LICENSING M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131			EXAMINER HSIEH, HSIN YI	
			ART UNIT 2811	PAPER NUMBER
			NOTIFICATION DATE 10/15/2010	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

**Advisory Action
Before the Filing of an Appeal Brief**

Application No. 10/580,625	Applicant(s) HUETING ET AL.
Examiner Hsin-Yi (Steven) Hsieh	Art Unit 2811

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 22 September 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☐ The period for reply expires _____ months from the mailing date of the final rejection.
b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
(b) ☐ They raise the issue of new matter (see NOTE below);
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☒ Applicant's reply has overcome the following rejection(s): See Continuation Sheet.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
The status of the claim(s) is (or will be) as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: 1-27.
Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

/Hsin-Yi (Steven) Hsieh/
Examiner, Art Unit 2811

Continuation of 5. Applicant's reply has overcome the following rejection(s): Rejection of claim 21 under 35 U.S.C. 112, first paragraph and rejections of claims 5-6, 10 and 21 under 35 U.S.C. 112, second paragraph.

Continuation of 11. does NOT place the application in condition for allowance because:

1. Applicant's arguments filed 09/22/2010 have been fully considered but they are not persuasive.
2. On page 8 of Applicant's Response, Applicant argues that the '455 reference teaches away from the Examiner's proposed modifications as implicitly admitted by the Examiner. The argument is based on that the Examiner relies on a motivation of routine experimentation and optimization to achieve a "desired device performance," despite providing no indication of what desired performance one skilled in the art would be attempting to achieve that would result in a hypothetical embodiment consistent with Applicant's claimed invention and the '455 reference teaches the relationship of the optimal or preferred thicknesses are opposite of those claimed.
3. The Examiner respectfully disagrees with Applicant's argument because the Examiner explicitly states that '455 reference does not teach away from the Examiner's proposed modifications in the office action mailed on 07/22/2010. Regarding the "desired device performance", it would be obvious to one of the ordinary skills in the art to know that the "desired device performance" depends on the specific application. For example, there are trade-offs between the ON resistance and breakdown voltages. For applications where speed of the transistor is needed to be high, the ON resistance has to be low and the breakdown voltage is allowed to be lower than the breakdown voltage of the transistors of lower speed. Thus "desired device performance" depends on the specific application. Regarding that '455 reference teaches the relationship of the optimal or preferred thicknesses are opposite of those claimed, the examiner explains that '455 reference discloses preferred embodiment and examples and does not teaching away using a device with the field plate insulator 16 thinner than the gate-field plate insulator 18. It is very common for the inventor to disclose a preferred embodiment in his invention but in no way the inventor is teaching away all other embodiments not included in the preferred embodiment.
4. On page 9 of Applicant's Response, Applicant argues that Applicant's specification indicates that aspects of the claimed invention directed to insulator thickness lead to unexpected results because "it might be thought that such low body thicknesses would result in problems of punch-through, but the field plate and the consequential reduced surface field effect raise the source-drain voltage at which punch-through occurs."
5. The Examiner respectfully disagrees with Applicant's argument because objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results and unexpected results must be established by factual evidence. (MPEP 716.01 (c) I)
6. On page 9 of Applicant's Response, Applicant argues that the '455 reference fails to correspond to aspects of the claimed invention directed to the thickness of the gate-field plate insulator being greater than or equal to the thickness of the field plate insulator.
7. The Examiner respectfully disagrees with Applicant's argument because the thicknesses of the gate-field plate insulator and the filed plate insulator in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device performance. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the thicknesses of the gate-field plate insulator and the filed plate insulator and the doping concentration within the range as claimed in order to achieve desired device performance. It is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)
8. On pages 9-10 of Applicant's Response, Applicant argues that by expressly teaching that film 16 should be thicker than film 18, the '455 reference teaches a relationship directly opposite, and therefore divergent, from the thickness of the gate-field plate insulator being greater than or equal to the thickness of the field plate insulator, as in the claimed invention.
9. The Examiner respectfully disagrees with Applicant's argument. Firstly, the '455 reference teaches a preferred embodiment that the first insulating film 16 (i.e., the asserted field plate insulator) is thicker than the second insulating film 18, but does not teach any reason that the thickness of the gate-field plate insulator can not be greater than or equal to the thickness of the field plate insulator. It is very common for the inventor to disclose a preferred embodiment in his invention but in no way the inventor is teaching away all other embodiments not included in the preferred embodiment. In the same way, the applicant specified in the instant application a preferred embodiment of the doping concentration of the drift region is such that the doping concentration adjacent to the drift region is higher than the doping concentration adjacent to the body region by a factor of at least 100, and further preferably at least 200 (page 3, lines 15-19 of the specification of the instant application). This disclosure does not teach away a factor of at least 100 because it is less preferable and also does not teach away another embodiment of a factor of at least 50 (page 3, lines 6-10 of the specification of the instant application). Secondly, the examples are given to show the details of the embodiments and are not intended to limit the scope of the invention. An example in the reference does not teach away other examples with different values. Most importantly, '455 reference teaches that the thickness of the gate-field plate insulator 18 is determined by a threshold voltage and the thickness of the field plate insulator 16 is determined by a breakdown voltage. Thus the thicknesses of these two layers depend on the application and for some applications (e.g. high threshold voltage and low breakdown voltage), the thickness of the gate-field plate insulator can be greater than or equal to the thickness of the field plate insulator using the method shown by '455 (paragraph [0031]). Thus '455 does not teach away from the asserted modification by leading in a direction divergent from the path that was taken by the Applicant.
10. On page 10 of Applicant's Response, Applicant argues that the combination would render the embodiment inoperable for its intended purpose because the '455 reference teaches that to achieve the desired performance regarding breakdown voltage and threshold voltage, the asserted field plate insulator has a thickness of approximately 3000Å and the asserted gate-field plate insulator has a thickness of approximately 450 Å. Decreasing the thickness of the asserted field plate insulator below 450 Å, for example, would result in a breakdown voltage well below the desired level for the asserted embodiment of the '455 reference. Under M.P.E.P. § 2143.01, the rejections cannot be maintained.
11. The Examiner respectfully disagrees with Applicant's argument because the thicknesses of the gate-field plate insulator and the filed plate insulator in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device performance. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the thicknesses of the gate-field plate insulator and the filed plate insulator and the doping concentration within the range as claimed in order to achieve desired device performance, which also means it would be operable for its intended purpose.
12. On page 10 of Applicant's Response, Applicant argues that the Office Action fails to provide proper motivation for the asserted

modification, because the Office Action fails to disclose what the desired device performance one of skill in the art would modify the asserted insulators to achieve.

13. The Examiner respectfully disagrees with Applicant's argument because it would be obvious to one of the ordinary skills in the art to know that the "desired device performance" depends on the specific application. For example, there are trade-offs between the ON resistance and breakdown voltages. For applications where speed of the transistor is needed to be high, the ON resistance has to be low and the breakdown voltage is allowed to be lower than the breakdown voltage of the transistors of lower speed. Thus "desired device performance" depends on the specific application.

14. On page 11 of Applicant's Response, Applicant argues that Examiner is engaging in impermissible hindsight reasoning.

15. The Examiner respectfully disagrees with Applicant's argument, because Omura et al. teach the device performances of the breakdown voltage and the threshold voltage and their relationships to the thicknesses of the gate-field plate insulator and the field plate insulator in paragraph [0031]. In order to achieve the desired device performance, e.g. specified breakdown voltage and the threshold voltage, the thicknesses of the gate-field plate insulator can be at least as thick as the thickness of the field plate insulator.

16. On page 11 of Applicant's Response, Applicant argues that the cited portions of the '455 reference do not correspond to aspects of the claimed invention directed to the drift region having a steeply graded doping concentration, with the concentration increasing from the body region to the drain region (e.g., the concentration is at least 50 times greater adjacent to the drain region than adjacent to the body region).

17. The Examiner respectfully disagrees with Applicant's argument, because the '455 reference teaches that the doping concentration has a graded concentration (Figs 16A to 16C) but does not teach the actual level. The reason for not specifying the steepness of the graded concentration because the actual level is commonly known by the routine experimentation and optimization which in general involves no novelty. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (MPEP 2144.05 II A)..